

U.S. Patent Application  
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ATTACHMENT A

Claims 1 - 70: (Cancelled)

71. (New) A propylene copolymer composition comprising:

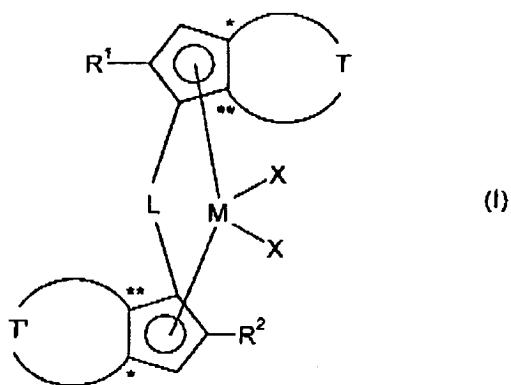
- A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; and
  - B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene;
- said propylene copolymer composition further comprising:
- (i) a MFR (230°C/2.16 kg) from about 1 to about 20 g/10 min;
  - (ii) a tensile E modulus according to ISO 527-2:1993 from about 400 to about 800 MPa; and
  - (iii) a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5.

72. (New) The propylene copolymer composition as claimed in claim 71, further comprising a melting point from 143°C to 150°C.

73. (New) The propylene copolymer composition as claimed in claim 71, further comprising a haze according to ASTM D 1003 from 25% to 40% without adding clarifying agents.

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74. (New) The propylene copolymer composition as claimed in claim 71, produced using a catalyst system comprising at least one metallocene compound of formula (I),



wherein

- M is zirconium, hafnium or titanium;
- X are, identical or different and are independently of one another, hydrogen, halogen, -R, -OR, -OSO<sub>2</sub>CF<sub>3</sub>, -OCOR, -SR, -NR<sub>2</sub> or -PR<sub>2</sub>, wherein R is a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or R may comprise at least one unsaturated bond, or two X radicals may be joined to one another;
- L is a divalent bridging group selected from the group consisting of a C<sub>1</sub>-C<sub>20</sub>-alkylidene radical, a C<sub>3</sub>-C<sub>20</sub>-cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub>-arylidene radical, a C<sub>7</sub>-C<sub>20</sub>-alkylarylidene radical and a C<sub>7</sub>-

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$C_{20}$ -arylalkylidene radical, which may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or a silylidene group comprising up to 5 silicon atoms;

$R^1$  is a linear or branched  $C_1-C_{20}$ -alkyl or  $C_3-C_{20}$ -cycloalkyl, wherein the  $C_1-C_{20}$  alkyl or  $C_3-C_{20}$  cycloalkyl may be substituted by at least one  $C_1-C_{10}$ -alkyl radical, or  $R$  is a  $C_6-C_{20}$ -aryl,  $C_7-C_{20}$ -alkylaryl or  $C_7-C_{20}$ -arylalkyl, wherein  $R$  may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, and  $R$  may comprise at least one unsaturated bond;

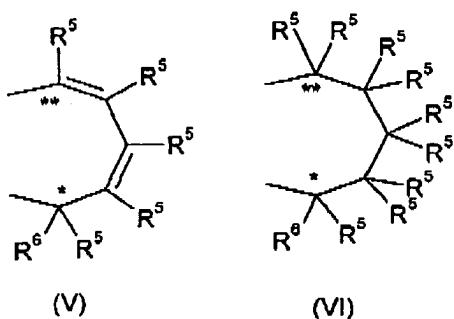
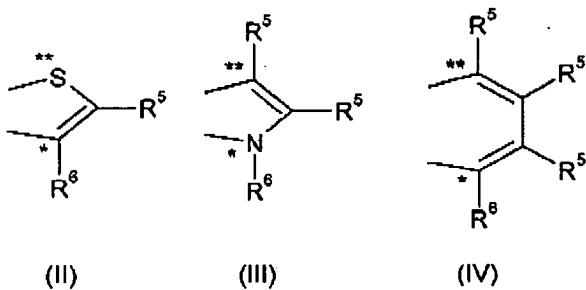
$R^2$  is  $-C(R^3)_2R^4$ ;

$R^3$  are, identical or different and are each independently of one another, a linear or branched  $C_1-C_{20}$ -alkyl or  $C_3-C_{20}$ -cycloalkyl, wherein the  $C_1-C_{20}$  alkyl or  $C_3-C_{20}$  cycloalkyl may be substituted by at least one  $C_1-C_{10}$ -alkyl radical, or  $R$  is a  $C_6-C_{20}$ -aryl,  $C_7-C_{20}$ -alkylaryl or  $C_7-C_{20}$ -arylalkyl, wherein  $R$  may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, and  $R$  may comprise at least one unsaturated bond, or two  $R^3$  radicals may be joined to form a saturated or unsaturated  $C_3-C_{20}$ -ring;

$R^4$  is hydrogen or a linear or branched  $C_1-C_{20}$ -alkyl or  $C_3-C_{20}$ -cycloalkyl, wherein the  $C_1-C_{20}$  alkyl or  $C_3-C_{20}$  cycloalkyl may be substituted by at least one  $C_1-C_{10}$ -alkyl radical, or  $R$  is a  $C_6-C_{20}$ -aryl,  $C_7-C_{20}$ -alkylaryl or  $C_7-C_{20}$ -arylalkyl, wherein  $R$  may comprise at least one heteroatom of groups 13-17

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of the Periodic Table of Elements, and R may comprise at least one unsaturated bond; T and T' are divalent groups of formula (II), (III), (IV), (V) or (VI),



wherein

the atoms denoted by the symbols \* and \*\* are joined to the atoms of the metallocene compound of formula (I) which are denoted by the same symbol, and

R<sup>5</sup> are, identical or different and are each independently of one another, hydrogen, halogen or a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17

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of the Periodic Table of Elements, or R may comprise at least one unsaturated bond;

R<sup>6</sup> are, identical or different and are each independently of one another, halogen or a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or R may comprise at least one unsaturated bond.

75. (New) The propylene copolymer composition as claimed in claim 74, wherein L is -SiMe<sub>2</sub>- or -SiPh<sub>2</sub>-.

76. (New) The propylene copolymer composition as claimed in claim 74, wherein R<sup>1</sup> is preferably a linear or branched C<sub>1</sub>-C<sub>10</sub>-alkyl group which is unbranched in the α position.

77. (New) The propylene copolymer composition as claimed in claim 76, wherein R<sup>1</sup> is a linear C<sub>1</sub>-C<sub>4</sub>-alkyl group.

78. (New) The propylene copolymer composition as claimed in claim 77, wherein R<sup>1</sup> is methyl, ethyl, n-propyl or n-butyl.

79. (New) The propylene copolymer composition as claimed in claim 71, wherein the alpha olefin is exclusively ethylene.

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80. (New) The propylene copolymer composition as claimed in claim 71, wherein the alpha olefin of B) is from about 7.01% to about 9.99% by weight.

81. (New) The propylene copolymer composition as claimed in claim 71, wherein the alpha olefin of B) is from about 8.0% to about 9.6% by weight.

82. (New) The propylene polymer composition as claimed in claim 71, wherein the MFR is from 6 to 12 g/10min.

83. (New) The propylene polymer composition as claimed in claim 71, wherein the tensile E modulus is from 550 to 750 MPa

84. (New) A process for producing at least one fiber, film or molding comprising:

- A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; and
- B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; said propylene copolymer composition further comprising:
  - (i) a MFR (230°C/2.16 kg) from about 1 to about 20 g/10 min;

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- (ii) a tensile E modulus according to ISO 527-2:1993 from about 400 to about 800 MPa; and  
(iii) a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5;

wherein the process comprises extruding or injection-molding the fiber, film, or molding.

85. (New). A film comprising a propylene copolymer composition comprising:

- A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; and  
B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene;  
wherein A) and B) are obtained using a catalyst system comprising at least one metallocene compound, and the propylene copolymer composition further comprises a MFR from about 1 to about 20, a tensile E modulus from about 400 to about 800 MPa, and a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5; and  
the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thick film.

86. (New) The film according to claim 85 further comprising a melting point of between about 143°C to about 150°C.

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87. (New) The film according to claim 85, wherein the film has a haze less than about 5% for a 1 mil thick film.

88. (New) The film according to claim 85, wherein the film has a dart impact greater than about 200 gm for a 1 mil thick film.

89. (New) The film according to claim 85, wherein the tensile E modulus of the propylene copolymer composition is from about 550 to about 750 MPa.

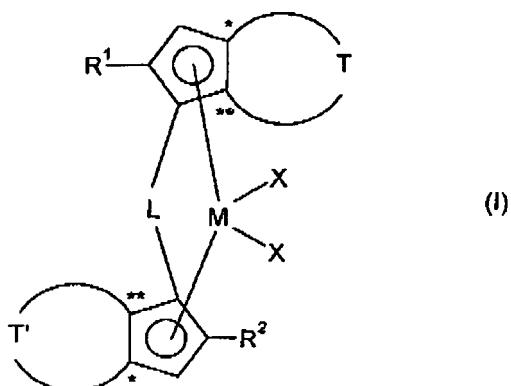
90. (New) The film according to claim 85, wherein the film further comprises a WVTR greater than about 11.6 gm/m<sup>2</sup>-day.

91. (New) The film according to claim 85, wherein the film further comprises a OTR greater than about 3875 gm/m<sup>2</sup>-day.

92. (New) The film according to claim 85, wherein the film further comprises a CO<sub>2</sub>TR greater than about 19,375 cc/m<sup>2</sup>-day.

93. (New) The film according to claim 85, wherein the film further comprises a hexane extractables not greater than about 2.6%, and xylene solubles less than about 30%.

94. (New) The film according to claim 85, wherein the metallocene compound is of formula (I):

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wherein

M is zirconium, hafnium or titanium;

X are, identical or different and are independently of one another, hydrogen, halogen, -R, -OR, -OSO<sub>2</sub>CF<sub>3</sub>, -OCOR, -SR, -NR<sub>2</sub> or -PR<sub>2</sub>, wherein R is a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or R may comprise at least one unsaturated bond, or two X radicals may be joined to one another;

L is a divalent bridging group selected from the group consisting of a C<sub>1</sub>-C<sub>20</sub>-alkylidene radical, a C<sub>3</sub>-C<sub>20</sub>-cycloalkylidene radical, a C<sub>6</sub>-C<sub>20</sub>-arylidene radical, a C<sub>7</sub>-C<sub>20</sub>-alkylarylidene radical and a C<sub>7</sub>-C<sub>20</sub>-arylalkylidene radical, which may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or a silylidene group comprising up to 5 silicon atoms;

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R<sup>1</sup> is a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, and R may comprise at least one unsaturated bond;

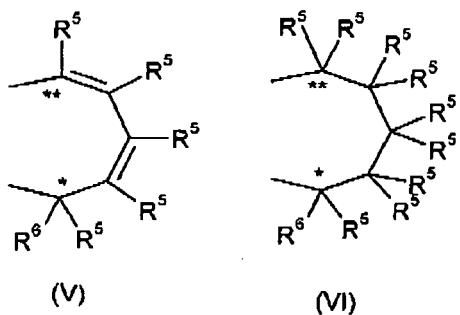
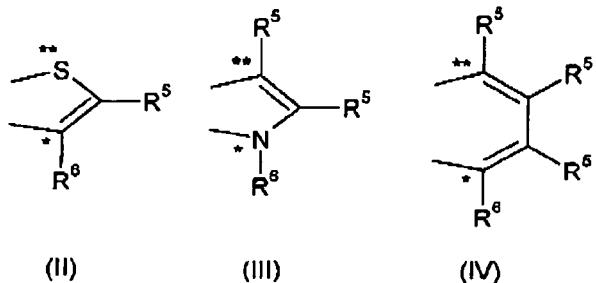
R<sup>2</sup> is -C(R<sup>3</sup>)<sub>2</sub>R<sup>4</sup>;

R<sup>3</sup> are, identical or different and are each independently of one another, a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, and R may comprise at least one unsaturated bond, or two R<sup>3</sup> radicals may be joined to form a saturated or unsaturated C<sub>3</sub>-C<sub>20</sub>-ring;

R<sup>4</sup> is hydrogen or a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, and R may comprise at least one unsaturated bond;

T and T' are divalent groups of formula (II), (III), (IV), (V) or (VI),

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wherein

the atoms denoted by the symbols \* and \*\* are joined to the atoms of the metallocene compound of formula (I) which are denoted by the same symbol, and

R<sup>5</sup> are, identical or different and are each independently of one another, hydrogen, halogen or a linear or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or R may comprise at least one unsaturated bond;

R<sup>6</sup> are, identical or different and are each independently of one another, halogen or a linear

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or branched C<sub>1</sub>-C<sub>20</sub>-alkyl or C<sub>3</sub>-C<sub>20</sub>-cycloalkyl, wherein the C<sub>1</sub>-C<sub>20</sub> alkyl or C<sub>3</sub>-C<sub>20</sub> cycloalkyl may be substituted by at least one C<sub>1</sub>-C<sub>10</sub>-alkyl radical, or R is a C<sub>6</sub>-C<sub>20</sub>-aryl, C<sub>7</sub>-C<sub>20</sub>-alkylaryl or C<sub>7</sub>-C<sub>20</sub>-arylalkyl, wherein R may comprise at least one heteroatom of groups 13-17 of the Periodic Table of Elements, or R may comprise at least one unsaturated bond.

95. (New) The propylene copolymer composition as claimed in claim 94, wherein L is -SiMe<sub>2</sub>- or -SiPh<sub>2</sub>-.

96. (New) The propylene copolymer composition as claimed in claim 94, wherein R<sup>1</sup> is preferably a linear or branched C<sub>1</sub>-C<sub>10</sub>-alkyl group which is unbranched in the α position.

97. (New) The propylene copolymer composition as claimed in claim 96, wherein R<sup>1</sup> is a linear C<sub>1</sub>-C<sub>4</sub>-alkyl group.

98. (New) The propylene copolymer composition as claimed in claim 97, wherein R<sup>1</sup> is methyl, ethyl, n-propyl or n-butyl.

99. (New) The film according to claim 85, wherein the MFR is from about 6 to about 12.

100. (New) An article comprising at least one layer of a film comprising a propylene copolymer composition comprising:

A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to

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10 carbon atoms, with the proviso that the alpha olefin is not propylene; and

- B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene;  
wherein A) and B) are obtained using a catalyst system comprising at least one metallocene compound, and the propylene copolymer composition further comprises a MFR from about 1 to about 20, a tensile E modulus from about 400 to about 800 MPa, and a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5; and  
the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thick film.

101. (New) A laminate comprising at least one layer of a polyolefin film and at least one layer of a film comprising a propylene copolymer composition comprising:

- A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; and  
B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene;

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wherein A) and B) are obtained using a catalyst system comprising at least one metallocene compound, and the propylene copolymer composition further comprises a MFR from about 1 to about 20, a tensile E modulus from about 400 to about 800 MPa, and a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5; and the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thick film.

102. (New) A coated article comprising a substrate and a film comprising a propylene copolymer composition comprising:

- A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; and
  - B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene;
- wherein A) and B) are obtained using a catalyst system comprising at least one metallocene compound, and the propylene copolymer composition further comprises a MFR from about 1 to about 20, a tensile E modulus from about 400 to about 800 MPa, and a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5; and the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil

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thick film, wherein the film has been coated onto the substrate.

103. (New) A co-extruded, multilayer film comprising at least one layer of a film comprising a propylene copolymer composition comprising:

- A) from 50% to 80% by weight of a propylene copolymer comprising from 0.05 to 0.99% by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene; and
  - B) from 20% to 50% by weight of one propylene copolymer comprising from about 7.01 to about 20.0 % by weight of at least one alpha olefin comprising from 2 to 10 carbon atoms, with the proviso that the alpha olefin is not propylene;
- wherein A) and B) are obtained using a catalyst system comprising at least one metallocene compound, and the propylene copolymer composition further comprises a MFR from about 1 to about 20, a tensile E modulus from about 400 to about 800 MPa, and a molar mass distribution  $M_w/M_n$  ranging from 1.5 to 3.5; and the film has a haze less than about 10.0% and a dart impact greater than about 150 gms for a 1 mil thick film.

104. (New) The process of claim 84, wherein the molding is a large hollow body.

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105. (New) The propylene copolymer composition of claim 71, wherein the propylene copolymer A) ranges from 60 to 75% by weight.

106. (New) The propylene copolymer composition of claim 71, wherein the propylene copolymer A) ranges from 65 to 72% by weight.

107. (New) The propylene copolymer composition of claim 71, wherein the propylene copolymer B) ranges from 25 to 40% by weight.

108. (New) The propylene copolymer composition of claim 71, wherein the propylene copolymer B) ranges from 28 to 35% by weight.

109. (New) The propylene copolymer composition of claim 71, wherein the tensile E modulus ranges from about 600 MPa to about 700 MPa.

110. (New) The propylene copolymer composition of claim 71, wherein the molar mass distribution  $M_w/M_n$  ranges from 2 to 2.5.

111. (New) The propylene copolymer composition of claim 71, wherein the molar mass distribution  $M_w/M_n$  ranges from 2 to 2.4.